formoterol (for-moe-te-role)
Foradil, Perforomist

Classification
Therapeutic: bronchodilators
Pharmacologic: adrenergics

Pregnancy Category C

Indications
As concomitant therapy for the treatment of asthma and the prevention of broncho-
spasm in patients who are currently (plan) but are inadequately controlled on a long-
term asthma control medication (e.g., inhaled corticosteroid) (Foradil only). Pre-
vention of exercise-induced bronchospasm (Foradil only). Maintenance treatment to
prevent bronchospasm in chronic obstructive pulmonary disease (COPD) including
chronic bronchitis and emphysema.

Action
Produces accumulation of cyclic adenosine monophosphate (cAMP) at beta adre-
nergic receptors, resulting in relaxation of airway smooth muscle. Relatively specific
for beta2 (pulmonary) receptors. Therapeutic Effects: Bronchodilation.

Pharmacokinetics
Absorption: Following inhalation, majority of inhaled drug is swallowed and ab-
sorbed.
Distribution: Unknown.
Metabolism and Excretion: Mostly metabolized by the liver; 10–18% excreted
unchanged in urine.
Half-life: 10 hr.

TIME/ACTION PROFILE (bronchodilation)

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
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</thead>
<tbody>
<tr>
<td>Inhal</td>
<td>&lt;15 min</td>
<td>1–3 hr</td>
<td>12 hr</td>
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Contraindications/Precautions

Contraindicated in: Hypersensitivity; Acute attack of asthma (onset of action is
delayed); Patients not receiving a long-term asthma-control medication (e.g., inhaled
corticosteroid); Patients whose asthma is currently controlled on low- or medium-
dose inhaled corticosteroid therapy.

Use Cautiously in:
Cardiovascular disease (including angina, hypertension, and arrhythmias); Diabetes; Seizure disorders; Glaucoma; Hypothyroidism; Pheochro-
omasomas; Excessive use (may lead to intolerance and paradoxical bronchospasm);
GI, Lactation, Pedi: Prepubertal lactation, or children <5 yr (may inhibit contrac-
tions during labor; use only if potential benefits outweigh risks; in children, a fixed-
dose combination product containing formoterol and an inhaled corticosteroid
should be strongly considered to ensure adherence).

Adverse Reactions/Side Effects
CNS: dizziness, fatigue, headache, insomnia, malaise, nervousness.
Resp: ASThma-RELATED DEATH, PARADOXICAL BRONCHOSPASM.
CV: angina, arrhythmias, hypertension, hypotension, palpitations, tachycardia.
GI: dry mouth, nausea.
F and E: hypokalemia.
Metab: hyperglycemia, metabolic acidosis.
MS: muscle cramps.
Neuro: tremor.
Derm: rash.
Misc: allergic reactions including ANAPHYLAXIS.

Interactions
Drug-Drug: Concurrent use with MAO inhibitors, tricyclic antidepress-
ants, or other agents that may prolong the QTc interval may result in seri-
cous arrhythmias and should be undertaken with extreme caution.
Risk of hypokalemia with theophylline, corticosteroids, potassium-losing diuretics.
Beta blockers may alter therapeutic effects; adrenergic effects may occur with con-
current use of adrenergics.

Route/Dosage

Asthma
Inhal (Adults and Children >5 yr): 1 capsule (12 mcg) every 12 hr using the
Aerolizer Inhaler.

Prevention of Exercise-Induced Bronchospasm
Inhal (Adults and Children >5 yr): 1 capsule (12 mcg) at least 15 min before
exercise on an as-needed basis; additional doses should be used for at least
12 hr.

COPD
Inhal (Adults): Foradil: 1 capsule (12 mcg) every 12 hr using the Aerolizer In-
haler. Perforomist: 20 mcg/2 mL unit-dose via jet nebulizer.

Dosage Forms:
Capsule: Foradil: 12 mcg, Perforomist: 20 mcg.
Inhaler: Formoterol: 12 mcg/actuation.
NURSING IMPLICATIONS

Assessment

- Assess lung sounds, pulse, and BP before administration and during peak of medication. Note amount, color, and character of sputum produced. Closely monitor patients on higher doses for adverse effects.

- Monitor pulmonary function tests before initiating and periodically to determine effectiveness.

- Observe for paradoxical bronchospasm (wheezing, dyspnea, tightness in chest) and hypersensitivity reaction (rash, urticaria; swelling of the face, lips, or eyelids). If condition occurs, withhold medication and notify physician or other health care professional immediately.

- Monitor ECG periodically during therapy. May cause prolonged QTc interval.

- Monitor patient for signs of anaphylaxis (dyspnea, rash, laryngeal edema) throughout therapy.

Lab Test Considerations: May cause serum glucose and decreased serum potassium.

Potential Nursing Diagnoses

Ineffective Airway Clearance (Indications)

Implementation

- Do not confuse Foradil with Fortical (calcitonin) or Toradol (ketorolac).

- Formoterol should be used along with an inhaled corticosteroid, not as monotherapy. Patients taking formoterol twice daily should not use additional doses for exercise-induced bronchospasm.

- Inhaler: For use with inhaler: Place capsule in the well of the Aerolizer Inhaler with dry hands; do not expose to moisture. The capsule is pierced by pressing and releasing the buttons on the side of the device. Medication is dispersed into the air stream when patient inhales rapidly and deeply through mouthpiece. Capsules are only to be used with Aerolizer Inhaler and should not be taken orally. Store capsules in the blister and only remove immediately before use. Store inhaler in a level, horizontal position. Aerolizer Inhaler should never be washed and should be kept dry.

- Do not use a spacer with formoterol.

- To use, pull off the Aerolizer cover. Hold the base of the inhaler firmly, and turn mouthpiece in the direction of the arrow to open. Push the buttons in to make sure four pins are visible in the capsule well on each side. Remove capsule from blister pack immediately before use. Separate one-blistered capsule by tearing at perforations. With lid-off technique, hold device with mouthpiece upward. Starting at the tear off corner, separate and peel off from paper backing and remove capsule. Place capsule in the capsule chamber in the base of the Aerolizer Inhaler. Never place a capsule directly into the mouthpiece. Twist the mouthpiece back to the closed position. With the mouthpiece upright, simultaneously press both buttons only once. A click should be heard as the capsule is being pierced. Release buttons; if buttons stick in depressed position grasp wands on buttons and retract before calculation. With patient sitting or standing in a comfortable upright position, exhale fully. Do not inhale into the device. Tilt head back slightly and breathe deeply by closing nose. A sweet taste will be experienced and a whistling noise heard. If no whistling is heard, the capsule may be stuck. Open inhaler and loosen capsule allowing it to spin freely. Do not repeatedly press buttons to loosen capsule. Hold breath for as long as comfortably possible after removing inhaler from mouth. Open inhaler to see if any powder is still in capsule. If powder is found, remove and discard empty capsule.

- Inhaler: For use with nebulizer: Administer via standard jet nebulizer via mouthpiece or face mask. Remove vial from foil immediately prior to use and discard via airway. May be stored in refrigerator for up to 3 mo.

Patient/Family Teaching

- Instruct patient to take formoterol as directed. Do not discontinue therapy without discussing with health care professional, even if feeling better. If a dose is missed, skip dose and take next dose at regularly scheduled time. Do not double doses. Use a rapid-acting bronchodilator if symptoms occur before next dose is due. Caution patient not to use more than 2 times a day or less than 12 hr apart; may cause adverse effects, paradoxical bronchospasm, or loss of effectiveness of medication (instruct patient to review medication guide with each Rx refill).

- Advise patient to have a rapid-acting bronchodilator available for use at all times for symptomatic relief of acute asthma attacks.

- Instruct patient to contact health care professional immediately if shortness of breath is not relieved by medication or nausea, vomiting, dizziness, headaches, fast or irregular heartbeat, or sleeplessness occurs.

- Instruct patient to notify health care professional if there is no response to the usual dose or if contents of one canister are used in less than 2 wk.
formoterol

Asthma and treatment regimen should be re-evaluated and corticoste-roids should be considered. Need for increased use to treat symptoms indicates decrease in asthma control and need to reevaluate patient’s therapy.

- Advise patient to consult health care professional before taking any Rx, OTC, or herbal products or alcohol concurrently with this therapy. Caution patient also to avoid smoking and other respiratory irritants.
- Advise patient to notify health care professional if pregnancy is planned or sus-pected, or nursing.
- Inhaler: Instruct patient on correct technique for use of Aerolizer Inhaler. Advise patient always to use new Aerolizer Inhaler that comes with each refill. Take sticker with "use by" date written by pharmacist from the outside of the box and place it on the Aerolizer Inhaler cover. If the date is blank, count 4 mo from the date of purchase and write date on sticker. Use new Inhaler and blister pack follow-ing the "use by" date.
- Inform patient that formoterol may increase the risk of asthma-related death.

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Evaluation/Desired Outcomes
- Prevention of bronchospasm.

Why was this drug prescribed for your patient?

- Canadian drug name
- Genetic Implication: CAPI TALS indicate l ife-threatening, underlines indicate most frequent. Strikethrough
- Discontinued